

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF THE POWELL'S VALLEY)
WATER DISTRICT, OF POWELL COUNTY,)
KENTUCKY, FOR APPROVAL OF CONSTRUCTION) CASE NO. 9819
AND FINANCING)

O R D E R

IT IS ORDERED that Powell's Valley Water District ("Powell's Valley") shall file an original and seven copies of the following information with the Commission with a copy to all parties of record no later than March 23, 1987. If the information cannot be provided by this date, Powell's Valley should submit a motion for an extension of time stating the reason a delay is necessary and include a date by which it will be furnished. Such motion will be considered by the Commission. Powell's Valley shall furnish with each response the name of the witness who will be available at the public hearing for responding to questions concerning each item of information requested.

1. Provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the existing water distribution system. These hydraulic analyses should demonstrate the operation of all pump stations and the "empty-fill" cycle of all water storage tanks. Computations are to be documented by a labeled schematic map of the system that shows pipeline sizes, lengths, connections, pumps, water storage

tanks, wells, and sea level elevations of key points, as well as allocations of actual customer demands. Flows used in the analyses shall be identified as to whether they are based on average instantaneous flows, peak instantaneous flows, or any combination or variation thereof. The flows used in the analyses shall be documented by actual field measurements and customer use records. Justify fully any assumptions used in the analyses. (Note - these analyses should use the same schematic as the analyses of the proposed water distribution system to facilitate comparison).

2. Provide a summary of any operational deficiencies of the existing water system that are indicated by the hydraulic analyses or that are known from experience.

3. Powell's Valley also filed computer hydraulic analyses for the proposed water distribution system with its application. Unfortunately these analyses did not depict the "on-off" operation of the existing and proposed pumps, the "empty-fill" cycles of the existing or proposed tanks, etc. Based on this, provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the proposed water distribution system. These hydraulic analyses should demonstrate the operation of all pump stations and the "empty-fill" cycle of all water storage tanks. Computations are to be documented by a labeled schematic map of the system that shows pipeline sizes, lengths, connections, pumps, water storage tanks, wells, and sea level elevations of key points, as well as allocations of actual customer demands. Flows used in the analyses shall be identified

as to whether they are based on average instantaneous flows, peak instantaneous flows, or any combination or variation thereof. The flows used in the analyses shall be documented by actual field measurements and customer use records. Justify fully any assumptions used in the analyses. (Note - these analyses should use the same schematic as the analyses of the existing water distribution system to facilitate comparison).

4. In order to obtain realistic results when utilizing computer hydraulic analyses to predict a water distribution system's performance, engineering references stress the importance of calibrating the results predicted to actual hydraulic conditions. This calibration process should include matching field measurements to the results predicted by the computer over a wide range of actual operating conditions. As a minimum this should include average and maximum water consumption periods, as well as "fire flow" or very high demand periods.

Based on the above, explain the procedures used to verify the computer hydraulic analyses filed in this case. This explanation should be documented by field measurements, hydraulic calculations, etc.

5. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available at the locations listed below on Powell's Valley's system. Identify the 24-hour period recorded, the exact location of the pressure recorder and the sea level elevation of the recorder. Also state the schematic junction number nearest the location of the pressure recorder.

a. Water line on the Powell's Valley's water system at or near the connection point to the Clay City water system.

b. The water storage tank in the vicinity of junction 9.

c. Water line in the vicinity of junction 5.

d. Water line in the vicinity of junction 20.

e. On the suction and discharge sides of the pump in line 2.

f. On the suction and discharge sides of the pump in line 50.

6. Provide a list of each of Powell's Valley's water storage tanks. Give the location, capacity, and overflow elevation of each tank. Explain how water is supplied to each tank.

7. Provide a list of each of Powell's Valley's existing pump stations. Give the location, number of pumps and their rated capacities, and the purpose of each pump station. Explain how the operation of each pump station is controlled. Provide a copy of the pump manufacturer's characteristics (head/capacity) curve for each of Powell's Valley's existing pumps. Identify each curve as to the particular pump and pump station to which it applies. Also state if pump is in use and if pump will remain in use, will be abandoned or will be replaced.

8. Provide a copy of the pump manufacturer's characteristics (head/capacity) curve on which the design of the proposed pump stations was based.

9. Provide the criteria used in determining the location, size, overflow elevation and head range for the proposed water storage tanks.

10. Provide a narrative description of the proposed daily operational sequences of the water system. Documentation should include the methods and mechanisms proposed to provide positive control of all storage tank water levels. The description should also include an hourly summary of how all tanks will "work" (expected inflow or outflow of water) and how all pumps will function. The description should be fully supported by appropriate field measurements and hydraulic calculations.

11. The engineering information submitted with the application indicates that Powell's Valley is proposing to install approximately 7 fire hydrants as part of this project. The "Recommended Standards For Water Works" by the Great Lakes - Upper Mississippi River Board of State Sanitary Engineers ("Ten States Standards") and the Insurance Services Office ("ISO") both have requirements for providing fire protection. Both organizations recommend a minimum of 6-inch diameter water lines and the capability to deliver at least 250 gallons per minute at a residual pressure of 20 pounds per square inch for a minimum of 2 hours from any fire hydrant. Based on the above, provide information as to the purpose of the proposed fire hydrants. If the purpose of the proposed fire hydrants is to provide fire protection, provide hydraulic analyses demonstrating the capability of Powell's Valley's system to comply with the requirements of the ISO and the Ten States Standards. If the fire hydrants are

proposed for reasons other than fire protection state why other equipment was not considered.

12. Provide the design criteria and related calculations used in sizing the proposed hydropneumatic station to be located on Highway 11. This should include a copy of the pump manufacturer's characteristics (head/capacity) curve on which the design of the proposed pump for the hydropneumatic station was based.

13. Provide a copy of each of the county court orders establishing Powell's Valley and defining its boundaries.

14. Provide a highway map at a scale of at least one inch equals two miles marked to show Powell's Valley's existing and proposed systems. The map of the systems shall show pipeline sizes, location, and connections as well as pumps, water storage tanks and sea level elevations of key points. The map shall also be marked to show the location of the water district's boundaries and labeled to indicate the appropriate court order from which each boundary was determined.

15. The plans filed for Contract 2, which includes the construction of the Happy Top Road pump station, do not depict the location of the pump station on the aerial photograph locations of the water distribution lines. Provide clarification concerning this matter. In addition, the proposed Happy Top Road pump station is to be a slab on grade, concrete block-brick veneer, building with a built-up roof. Provide documentation that supports this type construction. Also state whether a shingle type roof was considered for this building. In addition, state

whether a "can" type below ground pump station was considered. If neither was considered, state why not.

16. The plans for Contract 3, which include the construction of the hydropneumatic station, do not depict the location of the station on the aerial photograph locations of the water distribution lines. Provide clarification concerning this matter.

17. The computer hydraulic analyses filed in this case for the proposed water distribution system indicate that the potential exists for the system to experience low pressure (less than 30 psig) at Nodes 9, 13, 15, 20, 21, 35 and 48. Pressures of this magnitude are in violation of PSC regulation 807 KAR 5:066, Section 6 (1). Provide details on any preventive measures or additional construction Powell's Valley intends to perform to protect against this type of occurrence. Details should be documented by hydraulic analyses and field measurements.

Done at Frankfort, Kentucky, this 2nd day of March, 1987.

PUBLIC SERVICE COMMISSION


For the Commission

ATTEST:

Executive Director